

**Claims**

1. A method of providing a pattern on a solid dosage form which comprises application of powder material in a pattern to a substrate, the method comprising the steps:
  - 5 providing a mask having an aperture between a source of the powder material and the substrate;
  - applying the powder material to the substrate through the mask;
  - effecting relative movement of the substrate with respect to the source of the powder material during the pattern application process.
- 10 2. A method according to claim 1 wherein the position of the mask is fixed relative to the source of the powder material and the substrate is moved past both the mask and the source of the powder material.
- 15 3. A method according to claim 1 wherein both the mask and the substrate are moved past the stationary source of the powder material.
4. A method according to any preceding claim wherein the thickness of the mask is less than 2mm.
- 20 5. A method according to any preceding claim wherein the mask is placed such that the surface of the substrate is less than 2mm from the surface of the mask during delivery of the powder material.
- 25 6. A method according to any preceding claim wherein the aperture in the mask is round.
7. A method according to any one of claims 1 to 6 wherein the aperture in the mask is a slit whose length is along the direction of relative movement of the substrate.
- 30 8. A method according to any one of claims 1 to 6 wherein the aperture in the mask is a slit whose length is perpendicular to the direction of relative movement of the substrate.
9. A method according to any one of claims 1 to 6 wherein the aperture in the mask is a first slit intersected along its length by one or more further slits that extend transversely to the first slit.

10. A method according to any preceding claim wherein the powder material is an electrostatically charged powder material applied by electrostatic means comprising applying a bias voltage to generate an electric field between the source of the powder material and the substrate;

applying the electrostatically charged powder material to the substrate, the powder material being driven onto the substrate by the interaction of the electric field with the charged powder material.

11. A method according to claim 10 wherein the bias voltage is a DC voltage and powder is delivered continuously through the mask.

12. A method according to claim 10 wherein the bias voltage is a DC voltage in combination with a high frequency AC voltage and powder is delivered continuously through the mask.

13. A method according to claim 10 wherein the bias voltage is a low frequency AC voltage and powder is delivered periodically through the mask.

14. A method according to any one of claims 10 to 13 wherein the magnitude of the bias voltage is varied during application of the pattern.

15. A method according to claim 13 wherein the amplitude of the low frequency AC voltage is varied.

16. A method according to any one of claims 12, 13 or 14 wherein the frequency of the bias voltage is varied during application of the powder.

17. A method according to claim 14 wherein the voltage is varied as a constant polarity rectangular wave.

18. A method according to claim 14 wherein the voltage is varied as a constant polarity truncated triangular wave.

19. A method according to claim 17 or 18 wherein the electrostatically charged powder material comprises two components, the particles of a first component being of one colour and one charge to mass ratio and the particles of a second component being of a different colour and a different charge to mass ratio, the charge to mass ratios being such that only the particles with the lower charge to mass ratio are driven onto the substrate when the voltage is at its lower value and both component particles are driven onto the substrate when the voltage is at its higher value.

20. A method according to any preceding claim wherein the mask is made from an electrically insulating material.

21. A method according to any one of claims 10 to 20 wherein the mask is made from an electrically conducting material.

22. A method according to claim 21 wherein the bias voltage between the source of the powder material and the substrate is a DC voltage and an AC or DC blocking voltage is applied to the conductive mask.

23. A method according to any one of claims 10 to 20 wherein  
the mask has a matrix of dot apertures;  
the circumference of each aperture is electrically conductive;  
each conductive circumference is electrically insulated from the circumferences of the other dot apertures;  
and an AC or DC blocking voltage is used to individually address each circumference.

24. A method according to any preceding claim further comprising a second application of powder material by a method according to any one of claims 1 to 23.

25. A method according to claim 24 wherein the further powder material is applied only to areas of the substrate where powder was not applied in the first application.

26. A method according to any preceding claim wherein the substrate to which the powder material is applied is the solid dosage form.

27. A method according to claim 26 wherein powder material is applied to a solid dosage form containing active material.

28. A method according to claim 26 or 27 wherein powder material containing active material is applied to a solid dosage form.

29. A method according to any one of claims 1 to 25 wherein the powder material is applied to a substrate that is divisible into dosage unit forms.

30. A method according to any preceding claim wherein the solid dosage form is an oral dosage form.

31. A method according to any preceding claim wherein the solid dosage form is a pharmaceutical dosage form.

32. A method according to claim 31 wherein the pharmaceutical dosage form is a pharmaceutical tablet.

33. A method of applying powder material in a pattern to a pharmaceutical substrate that is divisible into unit dosage forms, the method comprising the steps:

providing a mask having an aperture between a source of the powder material and a pharmaceutical substrate;

applying the powder material to the pharmaceutical substrate through the mask;

effecting relative movement of the pharmaceutical substrate with respect to both the source of powder material and the mask during the pattern application process;

and, if desired, dividing the pharmaceutical substrate into unit dosage forms.

34. An apparatus for providing a pattern on a solid dosage form by application of powder material in a pattern to a substrate, the apparatus including

a source for powder material,

a support assembly for supporting the substrate in the vicinity of the source of the powder material,

a means for applying the powder material to the surface of the substrate,

and a mask with an aperture,

the apparatus being arranged such that, in use, the powder material is applied to the substrate through the aperture in the mask.

35. An apparatus as claimed in 34 wherein the mask is fixed relative to the source for powder material and the support assembly for the substrate is mounted for movement relative to both the mask and the source for powder material.

36. An apparatus as claimed in 34 wherein both the support assembly for the substrate and the mask are mounted for movement relative to the source for powder material.

37. An apparatus as claimed in any one of claims 34 to 36 wherein the thickness of the mask is less than 2mm.

38. An apparatus as claimed in any one of claims 34 to 37 wherein the mask is positioned such that the surface of the substrate is less than 2mm from the surface of the mask during application of the powder material.

39. An apparatus as claimed in any one of claims 24 to 38 wherein the aperture in the mask is round.

40. An apparatus as claimed in any one of claims 34 to 38 wherein the aperture in the mask is a slit whose length is along the direction of movement of the substrate.

41. An apparatus as claimed in any one of claims 34 to 38 wherein the aperture in the mask is a slit whose length is perpendicular to the direction of relative movement of the substrate.

42. An apparatus as claimed in any one of claims 34 to 38 wherein the aperture is a first slit intersected along its length by one or more further slits that extend transversely to the first slit.

43. An apparatus as claimed in any one of claims 34 to 42 wherein the source for powder material is a source for electrostatically charged powder material and the means for applying the powder material to the surface of the substrate comprises  
a voltage source for applying a bias voltage between the source for the powder material and the substrate to generate an electric field therebetween,

the apparatus being arranged such that, in use, the powder material is driven onto the substrate by the interaction of the electric field with the charged powder material.

44. An apparatus as claimed in claim 43 wherein the voltage source supplies a DC voltage.

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45. An apparatus as claimed in claim 43 wherein the voltage source supplies a DC voltage in combination with a high frequency AC voltage.

10 46. An apparatus as claimed in claim 43 wherein the voltage source supplies a low frequency AC voltage.

47. An apparatus as claimed in any one of claims 43 to 46 wherein the source for electrostatically charged powder material is a source for two-component powder material, the particles of a first component being of one colour and one charge to mass ratio and the particles of a second component being of a different colour and a different charge to mass ratio.

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48. An apparatus as claimed in any one of claims 43 to 47 wherein the mask is made from an electrically insulating material.

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49. An apparatus as claimed in any one of claim 43 to 47 wherein the mask is made from an electrically conducting material.

50. An apparatus as claimed in claim 49 wherein there is means for applying an AC or DC blocking voltage to the mask.

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51. An apparatus as claimed in any one of claims 43 to 47 wherein the mask has a matrix of dot apertures;  
the circumference of each aperture is electrically conductive;  
each conductive circumference is electrically insulated from the circumferences of the other dot apertures;  
and means whereby an AC or DC blocking voltage individually addresses each circumference.

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52. An apparatus as claimed in any one of claims 34 to 51 wherein wherein the substrate to which the powder material is applied is the solid dosage form and the support assembly is a support assembly for supporting a solid dosage form.

- 5 53. A solid dosage form that has had a pattern provided on it by a method according to any one of claims 1 to 33.